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Unified Messaging and Fax Toshiba's Strategy Enterprise Server

Overview:

Unified Messaging (UM) is an application that collects and displays a user's daily messages, e.g. voice, fax, email, etc. in one store, or location. This paper highlights Toshiba's Strategy Enterprise Server (ES) and the product's competitive advantages.

Audience:

IT Managers, Telecom Sales Professionals

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Unified Messaging

Unified Messaging (UM) is an application that collects and displays a user's daily messages, e.g. voice, fax, email, etc. in one store, or location. Various manufacturers of voice processing systems have taken that definition and expounded on it to suit their particular interpretation.

Some have made it a point to create an exclusive integration with an email service, mostly Microsoft Exchange that provides relatively tight functionality. However, this type of dependency on Exchange to hold all messages can cause concern for the Information Technology (IT) group of an organization due to the additional storage and maintenance burdens that voice mail messages, which are basically audio files, can create. For example, a one minute voice message from a Dialogic based voice processing system can require upwards of 240K of storage space on the hard drive. This is based on Intel's standard 32Kb ADPCM compression algorithm.

Other manufacturers, like Toshiba, do not rely on this interdependency. The Toshiba Strategy® Enterprise Server (ES) uses industry standard protocols to communicate with any email server that complies with these industry standards of SMTP, POP3, and IMAP4.

The Strategy ES Unified Messaging Feature Group can facilitate a UM solution in two ways; Microsoft® Outlook Integration and Internet Protocol Standard Integration. These integration options are selectable on a mailbox by mailbox basis, with the Outlook Integration providing the most comprehensive functionality of the two.

IMAP4 Synchronization

Whether the Outlook Integration or the IP Standard Integration option is selected, the Strategy ES software provides a back-end synchronization with the host email server by use of the industry standard Internet Message Access Protocol version 4 (IMAP4). By utilizing IMAP4 Strategy ES is able to identify its own messages on the email server and subsequently manage those messages based upon the individual user's requirements.

All Strategy ES based systems, including Strategy iES16, iES32 and all stand alone Strategy ES systems with Release 4.6 software or higher have IMAP4 UM synchronization capability. With IMAP4 synchronization, Strategy ES can work in collaboration with an IMAP4 compatible email server to provide the following capabilities;

- Messages deleted via the telephone from a Unified Messaging enabled voice mailbox are deleted from the user's email inbox.
- Messages listened to, but not deleted via the telephone user interface are marked as 'read' in the user's email inbox.
- Messages deleted from the user's email inbox can be deleted or moved to a selected Personal Message Folder within Strategy. This function is configurable on a mailbox by mailbox basis within Strategy.
- Voice and fax messages sent by Strategy ES to an email server can be marked for return receipt. If the email server supports Message Disposition Notification (MDN), a notification is sent back to the Strategy ES when a user accesses a Strategy ES voice or fax message from their email inbox. This notification can signal Strategy to move the associated message to the Saved or Personal Message Folder within the user's mailbox and extinguish the Message Waiting LED on the user's Strata telephone.

The IMAP synchronization is not dependent on whether the Microsoft Outlook Integration or Internet Protocol Integration is used. IMAP synchronization is available with both solutions.

Strategy ES – Microsoft Outlook Integration

To support a user-friendly interface for UM voice messaging from the desktop Toshiba provides an integrated application with Microsoft's Outlook email client. Microsoft Outlook gives application solution providers, like Toshiba, the ability to create custom email message types, called Forms. Toshiba used this technology to design a proprietary message Form that is triggered when a specific message type defined by Toshiba is received in Outlook.

Please be aware that Toshiba's Outlook Integration is not supported on Outlook Express as this product does not support custom forms. Outlook Express can be used with the IP Standard Unified Messaging solution that is described later in this document.

When the Strategy ES receives a voice or fax message, it sends a reference of that message via the Simple Message Transport Protocol (SMTP) to the email server. There is no stipulation that the email server must be Exchange, as Outlook will work with most any SMTP/IMAP4 email service. These reference messages contain not only a message type designation, but also pertinent information concerning the origin of the message, as well as the special identifying component for IMAP4 synchronization.

When these Strategy ES messages are accessed by the user, Outlook informs the Strategy ES proprietary Form that its message type has been selected. During its installation on the user's computer, the Strategy ES Form will have been configured with the network location of the Strategy Enterprise Server. Toshiba's custom Outlook Form contacts the Strategy ES directly and requests that the specified message be sent to the client's desktop. The system takes a few seconds to download the audio file from the Strategy ES. Once download is complete, a custom message Form is presented, complete with multimedia buttons with which to play the message. Messages can optionally be played over the multimedia speakers of the client computer or, for increased privacy, over a telephone connection established by the Strategy ES.

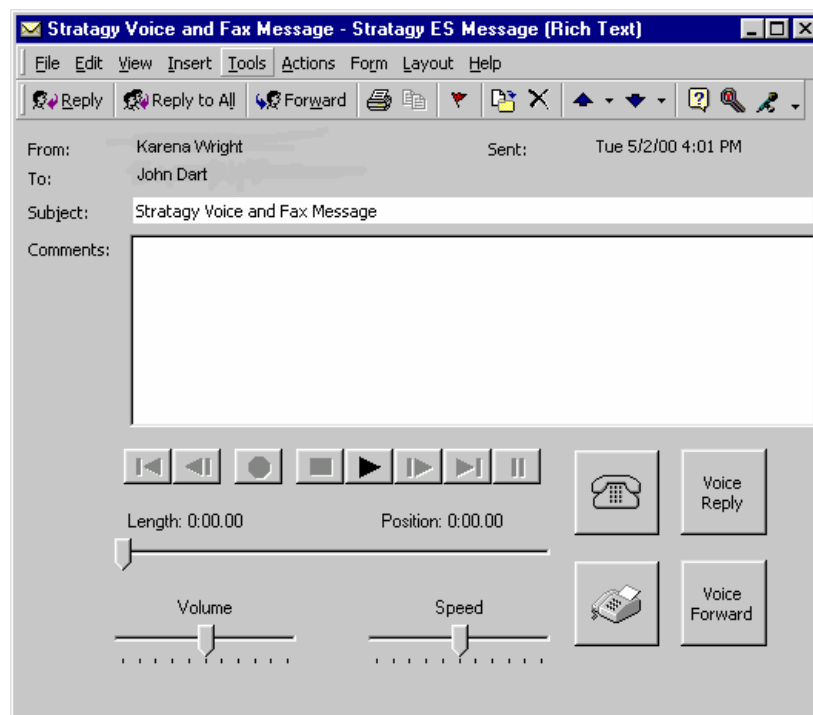


Figure 1.0: Strategy ES proprietary Form

Also included in this Strategy ES message Form are options to reply or forward the message to other Strategy ES users. If a fax is a part of the Strategy ES message, then an additional fax button is presented in the interface. When this button is clicked, the Form will launch whatever software application has been configured on the client computer to view Tagged Image Format (TIF) files.

At the top of the Form are the standard Outlook toolbar buttons (Reply/Reply to All/Forward). If these buttons are selected then the message will be treated simply as an email with a WAV file attachment. The user can then forward the message to anyone with an email address and multimedia speakers.

Message Management

The Strategy ES Outlook Integration provides two configurable settings to determine how voice and fax messages are managed in the Strategy ES once they have been downloaded to the client. By accessing the 'Configure Strategy Voice Mail' button embedded on the standard Outlook toolbar, users can specify;

1. Messages are to be moved to a message folder within the user's mailbox so that they can be accessed later for review.
2. Messages are to be deleted from the Strategy ES system, leaving the only copy of the message on the client computer.

Strategy ES Proprietary Outlook Integration software is supported on Windows XP, 2000, NT, and Windows 98 Second Edition.

Strategy ES Address Book

An additional component of the Strategy ES Proprietary Outlook Integration is the Strategy ES Address Book. This address book provides a collective list of Strategy ES mailbox numbers and user names. The user names are compiled from the Name 1 and Name 2 parameters within each mailbox. The Strategy ES Address Book is used for sending voice and/or fax messages back into the Strategy ES from the proprietary Outlook message Form.

Strategy ES Transport Provider

A Transport Provider is a mechanism that acts as a conduit for email messages to be efficiently transmitted to their defined destination. For example, within Outlook, the Exchange Server service and the Internet Mail service can be characterized as transport providers. Messages being sent through the Exchange Server, and then routed to their assigned destination, use the Exchange Server service. Messages to an Internet email account, use Internet Mail for routing. So, when a Strategy ES voice message is created using the Strategy ES Proprietary Outlook Form, and addressed to be sent back into a Strategy ES mailbox, Outlook assigns the Strategy ES Transport Provider to take control of the message. The Transport Provider packages up and transmits the voice message directly to the Strategy ES system, bypassing the host email server, and consequently relieving it of unnecessary traffic.

Strategy ES – Internet Protocol Standard Integration

If Microsoft Outlook is not being used as the email client, or when the client PC is located off-site and cannot access the Strategy server to download voice messages, then the only UM solution available with the Strategy ES is the Internet Protocol Standard integration. Since remote users may be on the public side of a corporate firewall, the required connectivity between Outlook and the Strategy ES will be blocked. To work within this network environment the Internet Protocol Integration simply packages Strategy ES messages as either WAV or TIF file (fax messages) attachments and utilizes the Internet standard Simple Message Transport Protocol (SMTP) to send them, in their entirety, to the host email server.

Incoming Strategy ES messages can either be deleted once they have successfully been sent to the email server, or left in the Strategy ES as new messages. If the Strategy ES mailbox has been configured for MDN, and the target email server supports Message Disposition Notification (MDN) return receipt, then when a user launches a Strategy ES message, then the email server will send the Message Disposition Notification to the SES. At this point, the Strategy ES can either move the voice message to a defined Message Folder or keep it in the new Message Folder and extinguish the Message Waiting LED on the user's Strata telephone.

IMAP4

As a part of the IMAP4 Synchronization, Strategy ES periodically checks a user's email Inbox message list to determine the disposition of Strategy ES voice messages that were sent there. If the user chooses to delete a SES email voice message from their email Inbox and Strategy ES detects this during its IMAP4 synchronization, Strategy ES will also delete it from the users voice mailbox, or move it to a defined Message Folder, as configured in the user's mailbox.

Table 1.0
Differences between the Microsoft Outlook Integration and the Internet Protocol Integration as a UM solution

Outlook Integration	Internet Protocol Standard Integration
Only a reference of a message is sent to the email server by the Strategy ES. The actual message is sent directly to the client computer.	The entire message is sent to the email server by the Strategy ES.
Message selection launches a Strategy ES proprietary Form.	Message selection launches the email client's standard message window with a WAV file (voice message) and/or a TIF file (fax message) attachment.
Strategy ES proprietary Form provides embedded control keys for voice message playback.	A separate client preferred program must be subsequently launched to play the WAV file or view the TIF file.
Messages can optionally be played over a telephone.	Messages can only be played over multimedia speakers.
Provides an Address Book that synchronizes with the Strategy ES mailbox directory.	Individual must manually add addresses to an Address Book.
When messages are accessed the Strategy ES can either delete them from the mailbox, or move them to another message folder within the mailbox.	Messages successfully sent to the email server are either automatically deleted from the Strategy ES or left as new messages in the user's mailbox. If MDN is available, then when the email Strategy ES message is opened from the email Inbox, Strategy ES is notified and can move it to a Message Folder, or leave it in the New Message Folder.

Voice messages accessible via the UM feature, but also fax messages that have been left in a user's mailbox. Let's take a look at the Fax Server Feature Group of the Strategy ES and how it interoperates with Unified Messaging.

Fax Services

The Fax Feature Group allows the Strategy ES to accept and transmit fax documents on behalf of users. The Strategy ES can also be configured to store documents for callers to request to have faxed back to them.

The Strategy ES Fax Feature Group is optional and must be enabled by Toshiba personnel. In both the Strategy iES32 and the standalone Strategy ES systems, fax capacities are based on the hardware configuration of the system.

Before we get into some of the various fax applications that are available with the Strategy ES, let's go over some of the hardware considerations for this feature.

Strategy iES32/iES16

The Strategy iES32 and iES16, being an integrated (or "in-skin") voice processing card for the Strata CIX, have onboard fax capability. This is commonly referred to as soft-fax, since no additional fax specific hardware is required to facilitate the feature. Rather, the system relies on Digital Signal Processor (DSP) technology to transform voice ports into fax ports. This is simply because ordinary voice transmissions are far different from fax transmissions, so the digital processing of those transmissions must be differentiated.

Since the DSP requirement for fax is not always necessary, it is handled as a Resource. A resource can be defined as a shared ability, because the voice ports share the resource, borrowing it when needed to perform fax services and then subsequently giving it back to free it up for other ports to use. Another analogy of a resource would be having two telephone lines with dial tone and eight telephones. The telephone lines are a resource for dial tone, but theoretically only two telephones can access these two lines. If another phone wants access to dial tone, then they must wait until the resource for dial tone is freed up by one of the two telephones.

In Strategy ES terminology, one allocation of a resource is called a **channel**. This terminology is the same for Auto Speech Recognition (ASR) and Text to Speech (TTS) resources as well.

In the case of the Strategy iES32 there are two channels of fax available for every 8 voice ports that have been configured on the card. This means that Strategy iES32 systems configured from 4 to 8 ports can share two fax resources. If more fax channels are required, then the quantity of voice ports must be increased to 12 or more. That being said, then the Strategy iES32 with a maximum capacity of 32 voice ports, consequently has maximum fax capacity of 8 channels.

Strategy ES standalone servers

Standalone Strategy ES systems also use a soft-fax method to provide fax services. In this case, the Dialogic D/4PCIU-F, D/41JCT-LS, and D/120JCT-LS boards can deploy fax resources when required for Strategy ES users. Each of these boards can support up to 4 simultaneous fax calls. The only limitation to the number of available fax channels is the number of Dialogic boards installed in the system. Fax channels are not restricted by software licensing.

Now let's discuss some ways in which fax can be performed in the Strategy ES.

Fax Applications

To begin with, it should be noted that the Fax Feature Group is not required if the Strategy ES is simply recognizing fax tone and transferring the call to a fax machine. Only when the system must accept or transmit a fax document is the Feature Group required.

Several fax applications can be programmed within the Strategy ES. These include the following;

Fax Mail - Fax Mail refers to the accepting and storing of fax messages within a user's Strategy ES mailbox. Users can retrieve fax messages either on demand when calling from a fax machine or by entering a fax machine's phone number to direct Strategy ES to transmit the fax on another line.

Incoming fax applications are typically triggered by a fax tone that is sent by the remote fax machine. When the Strategy ES answers one of its ports and hears a fax tone, the Strategy ES refers to its programming to determine how to deal with the incoming fax.

If a company's main greeting is playing when the fax tone is heard then generally the system's programming would either transfer the call to a telephone extension on the system that has a fax machine connected to it, or accept the fax and deposit it in a general delivery mailbox.

Fax On Demand/Fax Back – This application enables callers to have printed information (e.g. product brochures, price lists, etc.) faxed to them from the Strategy ES. Multiple documents may be transmitted in a single fax call. This feature requires some custom programming to be done for listing and selecting available documents and for collecting a fax number to which to transmit the documents. This custom programming can be done using Strategy's Token Programming Language. Tokens are simple to use and easy to manage. More complex database sourcing or document identification schemes may require custom programming to be done at a lower level. Toshiba's Integrated Software Solutions group is available to assist in this type of development.

Fax Broadcast – The Strategy ES Client Fax Printer Driver has the ability to create Distribution Lists to simultaneously fax documents to multiple fax destinations at a scheduled time. Fax Broadcast, on the other hand, is defined as a custom Strategy ES application that faxes one or more documents, at a scheduled time, to multiple clients, whose contact information is stored in a database. A custom script can be developed by Toshiba's Integrated Software Solutions group to meet a customer's specific requirements.

Client Fax Printer Driver

The Strategy ES Client Fax Printer Driver is special printer driver that has been customized by Toshiba to give individual users the ability to fax documents from their desktop PC to internal or external fax destinations using the fax resources of the Strategy ES. Any document on a user's computer that can be printed using the Microsoft-based print utility can also be faxed using Strategy ES Client Fax Printer Driver.

With the aid of this custom printer driver, when a user selects 'Print' and chooses 'Strategy ES Fax' as the printer device, the document is sent through the network to the Strategy ES. Strategy ES allocates a voice port, applies a fax resource, and sends the document like a fax to a destination fax machine. Users can also send documents into other user's Strategy ES mailbox, where they are stored as fax messages.

The Client Fax Printer driver also allows the ability to add a cover page to the document to be faxed. The cover page can be generic in nature, or it can be a custom cover page that contains a company logo or other graphics. There also is an ability to schedule faxes to be sent at a later time and/or date.

Access to these fax resources can be restricted by System Administrators to prevent abuse of Strategy ES fax resources by individuals.

Unified Messaging with Fax Server

When the Fax Server is bundled with the Unified Messaging Feature Group, users are offered an efficient and easy way to manage all types of messages, saving time and trouble. In a Unified Messaging environment, fax messages that arrive in a user's Strategy ES mailbox, are treated similarly to voice messages.

As described in the Unified Messaging segment of this document, when fax messages are accessed with Outlook and the Strategy ES proprietary Form, an additional button with a fax icon is displayed in the Form window. When this button is selected, the Form launches whatever software application that has been configured on the client computer to view TIF files. TIF is a standard for fax images. By default, on Windows-based computers, a software application called Imaging is designated to view TIF images. Toshiba does not sell image viewing software, and cannot be responsible for the behavior of any third party image software.

With the Internet Protocol Integration, Unified Messaging attaches a TIF file to the email sent to the host email server. Launching TIF files should launch the free Imaging software bundled with Windows, or any application configured for viewing TIF files.